

CLAIMS

What is claimed is:

1. A process for microencapsulating water insoluble oils, comprising the steps of:
 - 5 (a) forming a fine emulsion comprising said water insoluble oil and a complex polysaccharide in the presence of a starch;
 - (b) adding to the emulsion of step (a) a protein;
 - (c) adjusting the pH of the composition of step (b) to a pH 10 below the isolelectric point of said protein;
 - (d) densifying the composition of step (c); and
 - (e) adjusting the pH of the composition of step (d) to below about pH 10.
2. The process of claim 1, wherein at step (b) the emulsion is at 15 a temperature of about 40°C to about 50°C.
3. The process of claim 1 wherein at step (d) densification is accomplished by cooling said composition to a temperature below about 40°C.
4. The process of claim 1, further comprising step (f) adding a 20 cross-linking agent to the composition of step (e).
5. The process of claim 4, further comprising step (g) concentrating the microencapsulated composition of step (e) or (f).
6. The process of claim 5, further comprising step (h) spray drying the composition of step (e), (f) or (g) to produce dry, 25 microencapsulated oil particles.
7. The process of claim 5, wherein at step (g) the composition is concentrated by centrifugation.
8. The process of claim 1, wherein the water insoluble oil is selected from the group consisting of a marine oil, a plant oil, a microbial 30 oil, a poly-unsaturated fatty acid oil (PUFA), a flavor oil, an oil comprising an agriculturally active ingredient and an oil comprising a pharmaceutical.

9. The process of claim 1 wherein the polysaccharide is selected from the group consisting of gum Arabic, carageenans, xanthan gum, pectin, cellulose, cellulose derivatives, agar, alginates, furcellan, gum ghatti, güm tragacanth, guaran gum, locust bean gum, tamarind flour and arabinogalactan.

5 10. The process of claim 1 wherein the protein is selected from the group consisting of gelatin, β -lactoglobulin, soy and casein.

11. The process of claim 4 wherein the water insoluble oil is a PUFA; wherein the polysaccharide is gum arabic; wherein the protein is 10 gelatin; and wherein the cross-linking agent is glutaraldehyde.

12. The process of claim 4 wherein the water insoluble oil is a PUFA; wherein the polysaccharide cellulose; wherein the protein is gelatin; and wherein the cross-linking agent is glutaraldehyde.

13. The process of claim 4 wherein the water insoluble oil is a 15 PUFA; wherein the polysaccharide is gum arabic; wherein the protein is gelatin; and wherein no cross-linking agent is used.

14. The process of claim 4 wherein the water insoluble oil is a flavor oil; wherein the polysaccharide is gum arabic; wherein the protein is gelatin; and wherein the cross-linking agent is glutaraldehyde.

20 15. The process of claim 4 wherein the water insoluble oil is an agriculturally active ingredient; wherein the polysaccharide is gum arabic; wherein the protein is gelatin; and wherein the cross-linking agent is glutaraldehyde.

25 16. The process of claim 4 wherein the water insoluble oil is a pharmaceutical; wherein the polysaccharide is gum arabic; wherein the protein is gelatin; and wherein the cross-linking agent is glutaraldehyde.

17. A product made by the process of claim 1.